

Panel Discussion I

*What are the Grand Challenges for
Symbolic, Numeric and Algebraic
Scientific Computing?*

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Moderator

Panel Members

- James Demmel (UC Berkeley)
- Randolph Franklin (Rensselaer)
- Jeremy Johnson (Drexel)
- Marianna Safronova (Delaware)
- Jan Verschelde (UI Chicago)

Question #1:

Why does numeric computing need symbolic computing?

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Question #2:

How does one record
mathematical knowledge?

Question #3:

Are the most efficient
mathematical algorithms
made by humans, or
synthesized by computers?

Question #4:

Cell phones have digital filters derived from symbolic Gröbner basis;

the Shell corporation searches for oil using the Buchberger-Möller algorithm;

mechanical Stewart-Gough platforms are described by algebraic varieties;

the Phillips corporation can reduce their models via symbolic-numeric sparse interpolation:

is the next killer application of symbolic and numeric computation really predictable?

Question #5 (not discussed)
Can OpenSource and
academically developed
libraries such as LAPack and
LinBox and systems such as
SAGE compete with
commercial mathematical
software?